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Natural Resources in Montana's History

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Montana Historical Society, Gift of C. R. Smith

"Old Man Saw a Crane Flying Over the Land," C. M. Russell, Pen and Ink, 1920

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"Our real wealth—in addition to the character, quality and health of our people—is in the abundance and variety of our natural resources."

—Lee Metcalf

Montana has many valuable natural resources—minerals, forests, soil, water, grasslands, and wildlife. All of them have had a part in our history. In fact, it is impossible to tell the history of Montana without talking about our natural resources. The first white men who came to this area were looking for a way to get more furs. Others came for gold and silver. People used the forests for timber and the grasslands for pasture. Water has always been a valuable resource in our state, too. The purpose of this booklet is to explore the importance of those resources in our past, and their value today.

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Early People

The first people to live in what is now Montana may have come across a land bridge from Asia about 10,000 or 12,000 years ago. They slowly moved across the northern Great Plains. They were hunters. These early people pursued the giant *mastodon* and a kind of bison or buffalo. About 7,000 years ago, the climate changed, and the plains became almost like a desert. Most of the hunters and the animals they hunted *gradually disappeared.*

A thousand years passed. Other people came to the northern plains from the Southwest. They hunted small animals and gathered roots and plants. These new "foragers" lived in the western valleys between 4000 and 1000 B.C.

One more group of people, sometimes called the "late hunters," followed the herds of buffalo into Montana. The buffalo were the most important thing in their lives—they gave these people food, clothing, shelter, and weapons. The late hunters' *tepee rings* and *buffalo jumps* can still be seen in many places in Montana.

Most of the Indian tribes who now live in Montana didn't arrive here until after 1600 A.D. These Indians had been slowly pushed west by other tribes. Those tribes were also driven from their hunting grounds by Indians who had been driven out by white settlers in the eastern *colonies.*

The Plains Indians first got horses about 1680 by trading with Indians who had gotten them from the Spaniards in New Mexico. The horse let them move swiftly, which was a big help to the Indians in hunting and warfare. When the Indians got guns from traders, and from other Indians, they became a powerful force on the prairies.

All these early people were close to nature. They knew their lives depended on the animals they hunted, the water they drank, and the land they lived on. They did not kill animals for sport or waste the meat. The Plains Indians also found a deep religious meaning in their surroundings. The Indians believed that they were a part of the world they lived in.

Western Expansion

By about 1770, Americans had started to move from the eastern *colonies* into the mountains and valleys farther west. In 1801, when Thomas Jefferson became president, he already had plans for Americans to claim the *territories* west of the Mississippi River. He knew that if the United States didn't get the land, another nation would.

By 1803, the French were willing to sell a huge area of land in America. That land included much of the central plains and part of the Rocky Mountains. The sale of this land to the United States became known as the Louisiana Purchase. President Jefferson had decided to send an *expedition* to explore the *region.* He asked Congress for $2,500 to outfit explorers headed by Meriwether Lewis and William Clark. Jefferson wanted to know about this new part of the United States—what it looked like, and what value it had.

President Jefferson also wanted to know more about the lands west of the Louisiana Purchase to the Pacific Ocean. Lewis and Clark were told to look for the "Northwest Passage," a water route that was supposed to go from the Atlantic Ocean to the Pacific Ocean. They were also asked to write down information about the plants and animals they saw, and to find out all they could about Indians in the area. President Jefferson asked the explorers to keep journals of their trip.

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"Lewis and Clark Meeting Indians at Ross' Hole."

C. M. Russell Mural — State Capitol, Helena, Montana.

Both Lewis and Clark had been in the militia (or army). They were *frontiersmen* used to living in the outdoors, and they had many useful skills. Lewis had been Jefferson's secretary. In preparation for the journey, Lewis was taught to use the stars to find his way. He also learned how to identify plants and animals. Clark was an engineer. He knew how to handle boats and men, and he understood geography and map-making. He also knew how to care for his men if they got sick or hurt. The expedition was well supplied with medicines and trade goods—beads, knives, ammunition, and blankets.

> "The country in every direction around us was one vast plain in which innumerable herds of buffalo were seen attended by their shepherds the wolves."
>
> —Meriwether Lewis

Leaving St. Louis on May 14, 1804, Lewis and Clark and their men, who were called the "Volunteer Corps of Discovery," moved 1,600 miles up the Missouri River. They often had to use poles to push their boats upstream. The expedition spent the winter at the Mandan Indian villages in what is now North Dakota. They learned as much as they could from the Indians about the land to the west. The explorers hired guides. One of the most valuable additions to the expedition, as it turned out, was Sacajawea, a 17-year-old Indian girl. Her husband was an *interpreter.* Clark trained the twenty-five army "regulars" they had chosen. The men built smaller boats and got their equipment ready for the long, dangerous journey ahead.

In the spring of 1805, Lewis and Clark pushed into the *uncharted* land. The explorers paddled up the rough, muddy Missouri past the mouth of the Yellowstone River. As the explorers came to each new river, they gave it a name. When they reached the Marias River, Lewis went up that stream. He hoped to find a passage leading to the Pacific Ocean, but did not. He rejoined Clark, and the expedition reached the Great Falls of the Missouri in the middle of June. There, Lewis wrote in his journal that the Great Falls were "the grandest sight I ever beheld." By July 19, 1805, they were paddling through the Gates of the Mountains, whose towering rock walls seemed to slide apart to let their boats pass.

The expedition continued south to the Three Forks of the Missouri, where the Jefferson, Madison, and Gallatin rivers meet. Heading southwest, they pushed up the Jefferson and Beaverhead rivers. The explorers *cached* their canoes by sinking them in beaver ponds. They traded with the Indians for horses, and crossed over Lemhi Pass. They traveled down the Bitterroot Valley and over Lolo Pass. Then they built more canoes and headed down the Clearwater River to the Columbia River, and on to the Pacific Ocean. Often game was scarce, and they traded with the Indians for *camas* roots and dried fish. On the coast, the men built a group of cabins they called Fort Clatsop, and spent a long, boring, wet winter.

On the trip back up the Columbia River, the explorers were able to avoid some of the worst rapids by *portaging* their canoes. When they again reached the Clearwater River, they began to plan for the return journey over the Rockies—where, as Clark wrote, they had suffered extreme hunger and cold on their way west. He says in his journal that "not any of us have yet forgotten our sufferings in those mountains in September last, I think it probable we never shall."

The two leaders separated when they reached the Bitterroot Valley. They wanted to know more about the geography and wildlife of the region. Lewis crossed the rugged Continental Divide and went up the Marias River. Clark returned to the Three Forks of the Missouri River, on to the Gallatin Valley, and down the Yellowstone River. The boats moved faster downstream. One day they went 83 miles. The expedition members met again near Fort Mandan on the Missouri River and completed their long, difficult journey together. Some people were surprised that they had lived through it. The expedition had not been heard from in two years.

Lewis and Clark had made careful records of the weather, soils, minerals, and wildlife as they traveled. They drew maps showing mountain ranges, rivers, and passes through the mountains. The explorers' journals told of *plentiful* fur-bearing animals and other wildlife, good soil, thick forests, and many rivers. Lewis and Clark's exploration showed that the Louisiana Purchase was a rich addition to the growing United States.

The Fur Trade

People have always liked furs for their beauty and warmth. Before houses had furnaces, people who could afford furs wore them to keep warm indoors as well as outdoors. When the fur trade began in what are now Canada and the United States, there was a great demand for furs by wealthy people in Europe and China.

The first white men who trapped and hunted in the Northwest came down along the Rocky Mountains from what is now Canada. Others followed Lewis and Clark's route up the Missouri River. Later more trappers and fur traders came from the Pacific Coast. They moved up the streams where there were many beaver, mink, and river otter. Most of the trappers sold their furs to one of the big fur-trading companies. These companies set up trading posts that they called "factories," run by a person called a factor. The factor traded with both white and Indian trappers.

Manuel Lisa's Missouri Fur Company was the first American fur-trading company to establish a fort in Montana. It was built on the Yellowstone River in 1807 at the mouth of the Bighorn River. The American fur companies did not send out big groups of trappers. They sent trappers who worked alone

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Joseph Meek and other mountain men explored and trapped along the streams of the Rocky Mountains in the early 1800s.

or in pairs. These men lived the way the Indians did, and they spread out across the huge *expanses* of the Rocky Mountains.

This was the time of the mountain men, some of the most *remarkable* people in the history of the west. They lived and worked in conditions that are hard for us to imagine today. They had to wade in icy water to set traps. Often the trappers ate only wild meat and a dry bread called bannock. Sometimes they went for months without seeing other people.

By the 1850s, many of the streams that had been rich in beaver, mink, and otter were trapped out. The fur trade gradually gave way to a trade in buffalo hides. During this time, thousands of bales of furs had been sent by steamboat down the Missouri River to the city of St. Louis, which was the center of America's fur trade.

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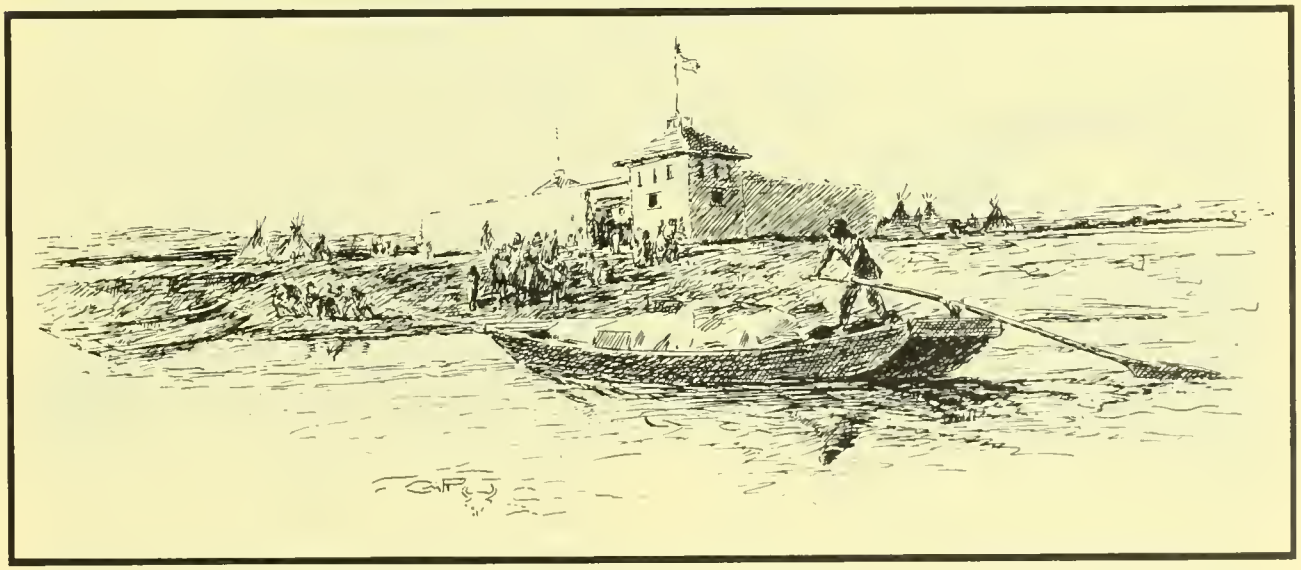

"Flatboat on River, Fort in Background," (Fort Union), C. M. Russell, Pen and Ink, 1925

Minerals

Gold and Silver

Besides furs, there was another treasure in the cold waters of the mountain streams. In 1852 a man called Benetsee may have been the first to find gold in a stream in Montana. The place was Gold Creek, near present-day Drummond. However, it wasn't until ten years later that a big "strike" came, along Grasshopper Creek at Bannack. Hundreds of *prospectors* moved north to Bannack from worked-out gold diggings in California, Nevada, and Colorado. Over 500 mining camps grew up in the *gulches* of western Montana. From 1862 to 1876, those placer gold deposits produced well over $90 million worth of gold.

Most placer gold was found by washing (or panning) the gravel of creek beds. This gold had been washed by the water out of deposits in the rocks. Gold is heavier than most minerals. It sank to the creek bottoms and collected in what were called placer deposits. A man with a gold pan and a pick and shovel could get this kind of gold. Quartz (or hard-rock) mining was very different.

Both gold and silver were found in the quartz rocks of our mountains. Unlike placer mining, quartz mining took money—lots of it. The rock had to be blasted loose with dynamite. Then it had to be broken into small pieces. The machinery for this kind of mining was expensive. Much of the money

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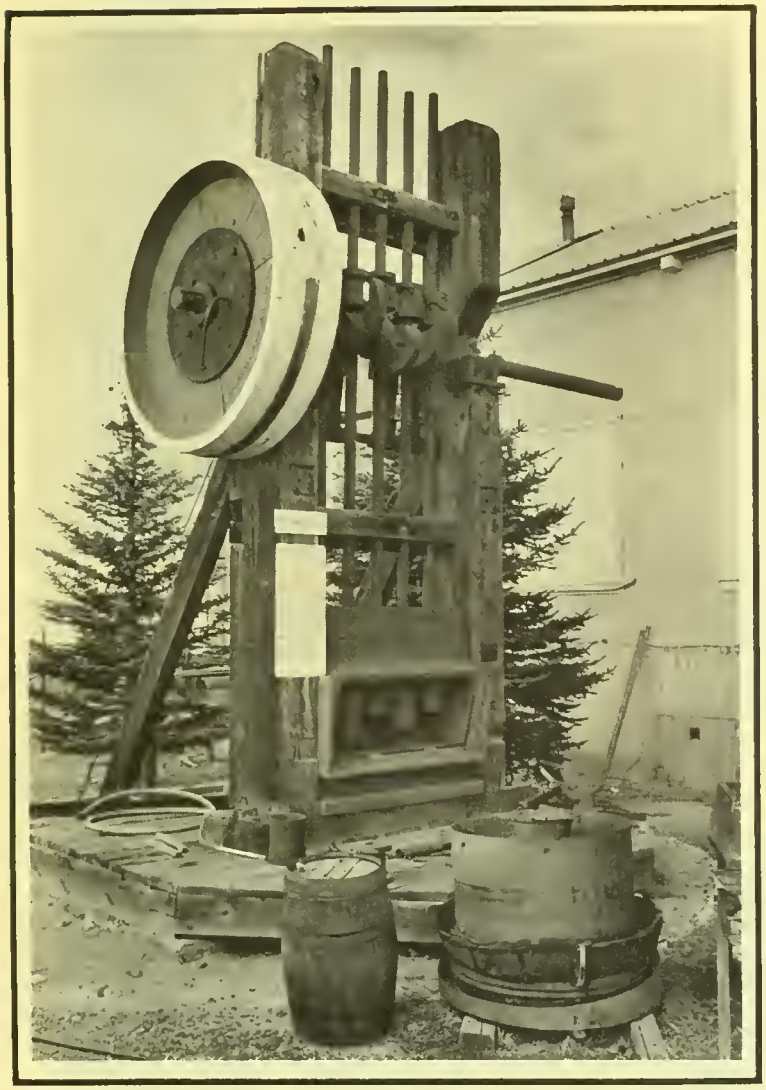
Steamboats like this carried furs and hides down the Missouri River. They brought supplies and people upstream, too. The tall poles on either side of the deck are winches that were used to load and unload cargo. The upper deck had room for passengers. Notice the wood stacked on the lower deck — wood was burned to make the steam that powered the boat.

Photo by Walter Hinnick, Montana Standard



Stamp mills pounded ore into small pieces before the ore was sent to the smelters. You can see this stamp mill at the World Museum of Mining in Butte.

needed to buy the equipment came from people called investors who lived in the eastern United States. Some of the money even came from England and France. These people paid for the cost of the mining so they could make money. Most of them never came to Montana.

Now the steamboats that had carried the wealth of furs to St. Louis were headed upriver, loaded with the heavy parts of stamp mills. The boats plowed up the Missouri River to a place about 20 miles below the Great Falls. There, at Fort Benton, the machinery was loaded onto freight wagons for the trip to the gold and silver mines in the mountains to the west.

The sound echoed through the canyons, as the heavy weights of the mills pounded the *ore*. After the big chunks of rock were broken into very small pieces, the ore was loaded into wagons. After 1880 most ore was sent by rail. It was hauled to *smelters*, like that built by Marcus Daly in Anaconda in 1877. There the ore was heated in containers in huge furnaces, and the gold or other metals melted. The metals sank to the bottom of the container, and were separated from the rest of the materials. Then the valuable metals were shipped to *concentrators* for further processing.

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Marcus Daly was the first "Copper King." His Anaconda mine produced the richest copper ore ever mined.

Copper

Montana's most famous mining town, Butte, began as a gold camp. Then silver was found with the gold. Later copper was found deeper in the earth. The copper that was mixed with the silver ore made trouble for the miners. These two metals were hard to separate, and the copper was considered a nuisance.

But in the 1880s, telephone lines began to stretch across America. Copper was needed to make telephone and electric wire. It was a good, inexpensive *conductor* of electricity. The price of copper went up, and Butte became the biggest boom town in Montana. Butte remained a major copper mining town for one hundred years, until the 1980s. Then the mines shut down because cheaper copper could be gotten from South America.

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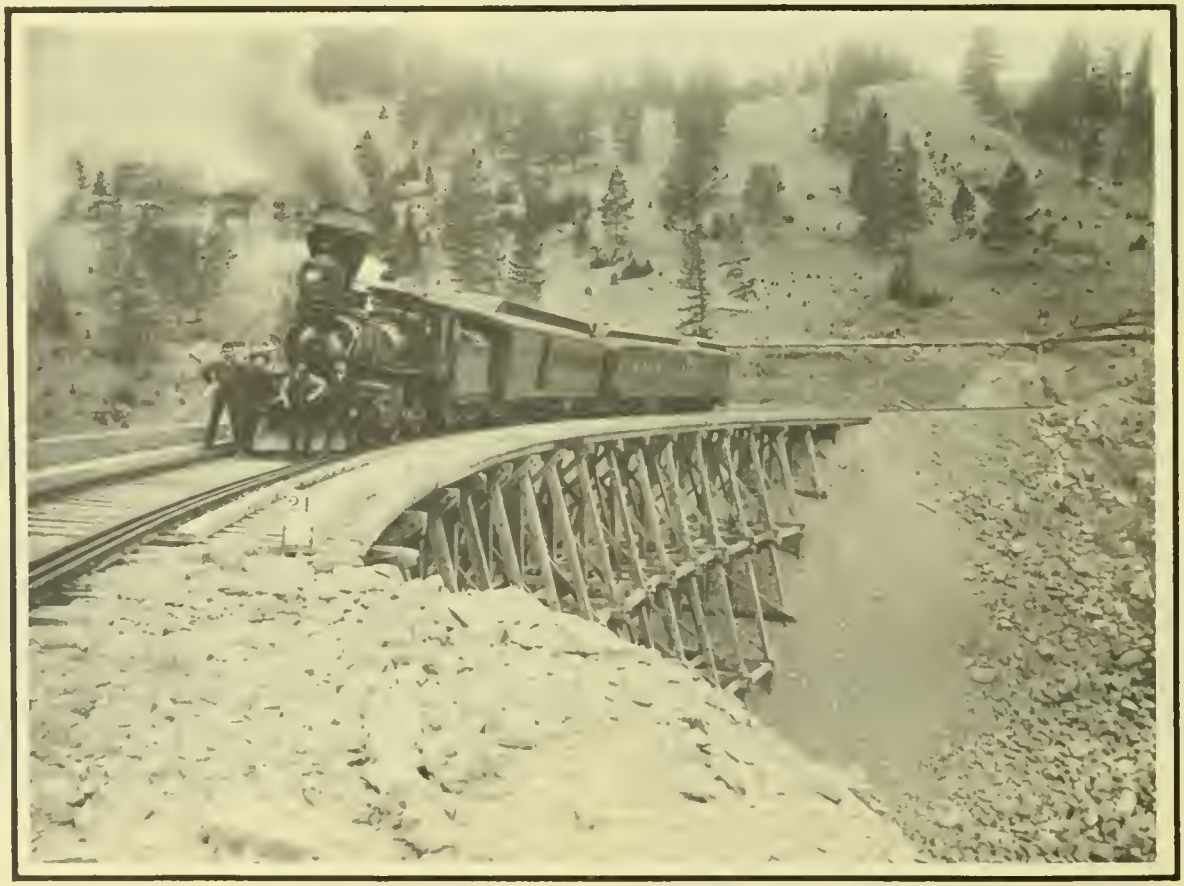

Steam-powered locomotives pulled passengers and freight along Montana's railroads. This one was near Marysville.

Coal

Other minerals found in Montana are valuable, too. Coal is one of them. It was used to fuel the ore smelters. In the 1880s and 1890s the railroads all used steam locomotives that burned coal. Near Bozeman, on the Yellowstone-Gallatin Divide, several underground coal mines opened to supply the railroads. Mines at Stockett and Belt opened near Great Falls. A rich coal *vein* was discovered at Bear Creek near Red Lodge. The Bear Creek mine became the biggest producer of coal in Montana by 1910. These mines employed hundreds of men. But underground mines were difficult and dangerous to work.

Strip mining began at Colstrip in eastern Montana in 1924 and is still being done today. Strip mining takes the coal that is close to the surface of the ground. Big machines are used, so fewer miners are needed than in underground mining.

Times changed; *diesel* and electric engines replaced the locomotives that used coal for fuel. Natural gas and oil gradually replaced coal for heating in homes. For many years, there was not much demand for coal.

Coal didn't become important again until the energy crisis of 1973. Then foreign suppliers stopped oil from coming to the United States. Coal was needed to produce electricity. Montana coal was low in sulfur, and burned cleanly. Coal close to the surface was easier to mine, and there was plenty of it in Montana. Best of all, it was here in the United States, not overseas. Once again, in the 1970s, railroad cars loaded with coal began moving across our state. Nine-tenths of the coal goes to markets out of the state, but some is used in Montana to produce electricity at generators at Colstrip and other places.

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These coal miners checked the damage after a cave-in at the Foster mine, Bear Creek.

Oil and Natural Gas

In Montana oil is often found in the same areas as coal. Our state came into the oil business later than Texas, Oklahoma, and Wyoming. They are all big producers of the "black gold," as oil is sometimes called. In 1915 oil was discovered at Elk Basin just north of the Wyoming border in Carbon County. Other finds followed, near Roundup and on Cat Creek in the Mussellshell Valley. The rich Kevin-Sunburst oil field was opened in 1922 north of Shelby.

The *Great Depression of the 1930s* slowed oil production. However, in the late 1930s, a new *refinery* was built at Laurel. After World War II, the demand rose for petroleum products (those made from oil). The refineries in Billings opened in the late 1940s. Valuable oil fields began producing near Conrad and Cut Bank in the 1950s. Oil was found in the Williston Basin near the eastern border of Montana. The last major find was at Bell Creek in Powder River County in 1967.

The first discoveries of natural gas were in the Baker-Glendive area. Many of the north central Montana oil fields had deposits of natural gas. Pipelines were built to carry this inexpensive fuel to homes and businesses in the central part of our state. Today, the Tiger Ridge field discovered in 1967 is still the major producer of natural gas.

Other Minerals

At the present, several other minerals are doing well in the state's mining industry. The sound of blasting was heard in Butte in 1986. It was a welcome sound that signaled the reopening of the copper mines. In the mountains near Columbus, one of the earth's truly rare metals, chromite, is again being mined after a long shutdown. New veins of talc have been opened along the Gravelly Mountain Range in Madison and Beaverhead Counties. The world's largest vermiculite mine is operating north of Libby. Several gold mines have reopened, where workers use huge machines instead of picks and shovels. New methods have made it easier to separate the gold from the ore. An open-pit mine near Zortman and Landusky, another north of Whitehall, and a third south of Helena are among those producing gold. Tungsten, nickel, platinum, and palladium are also being mined. They add to the value of our mineral industry.

The places now producing metals, minerals, and fossil fuels (oil, natural gas, and coal) are shown in the map. Montana's top nonfuel minerals are listed in their order of importance in table 1.

Table 1.

Montana's Top Nonfuel Minerals — 1985

Mineral	Value	Uses
Gold	$51 million	Jewelry, computer circuitry
Sand and gravel	$26 million	Roads, construction
Silver	$24 million	Jewelry, photography, coins
Copper	$22 million	Wire
Clays	$ 8 million	Drilling mud, steel production
Stone	$ 5 million	Building
Gems (Sapphires)	$ 400,000	Jewelry, industrial use
Lead	$ 356,000	Steel manufacture, batteries, solder

Map 1. The shaded areas in this map show major coal fields in Montana. Deposits of other minerals are indicated by symbols.

Mining has provided jobs for thousands of Montanans and billions of dollars worth of precious metals, coal, and oil to national and world markets. There is another side to mining, though. The rich deposits of minerals in the earth can't be reached without digging and blasting. Mining disturbs more than the soil and rocks. Toxic (poisonous) materials can be released into streams and underground water. These toxic wastes can kill fish and animals, and make water unfit for human use.

Repairing the damage is called reclamation. Both the state of Montana and the United States government have passed laws to correct or prevent the problems caused by mining. Reclamation tries to make the land look much as it did before mining. Topsoil is replaced, and often *native grasses* or shrubs are planted. Streams that have been *polluted* with mine wastes are cleaned up. Mining (and other industries) are important to our state. But so is our environment.

Agricultural Products

Agriculture, or farming, began in Montana soon after *missionaries* came to the Bitterroot Valley. They built St. Mary's Mission. In the spring of 1842, they planted seeds brought from what are now Oregon and Washington. They also built the first flour mill in Montana. By 1866, mills in Missoula, Bozeman, Three Forks, and other towns were making flour from wheat grown in Montana.

Photo by Jim Bond

These are a few of the agricultural products that carry the label, "Made in Montana."

In the growing towns, the people wanted fresh vegetables and meat. Farmers brought chickens, eggs, and milk into the towns to sell. Cattle traders began trading trail-weary cattle and oxen along the main routes of travel. They let the animals rest and fatten up, and then traded again—one in good condition for two off the trail. A man named Johnny Grant had driven the first large herd of cattle into Montana in 1858. The ranch he started, near Deer Lodge, now called the Grant-Kohrs Ranch, became the largest in the state. From these beginnings, beef cattle became Montana's chief product.

The dairy industry began in 1895 in Big Timber. At one time, many towns had small dairies that processed milk into cheese and butter. In 1987 there were 263 dairy producers in Montana.

Although meat-packing began before 1885, other products weren't canned *commercially* in Montana until 1915. In that year, the first cannery opened near Stevensville, processing cherries, beans, and peas. Other canneries were built at Bozeman, Billings, and Red Lodge. The first sugar processing factory opened in 1905 in Billings, using sugar beets. (Sugar beets are a special kind of beet from which sugar can be *processed.*)

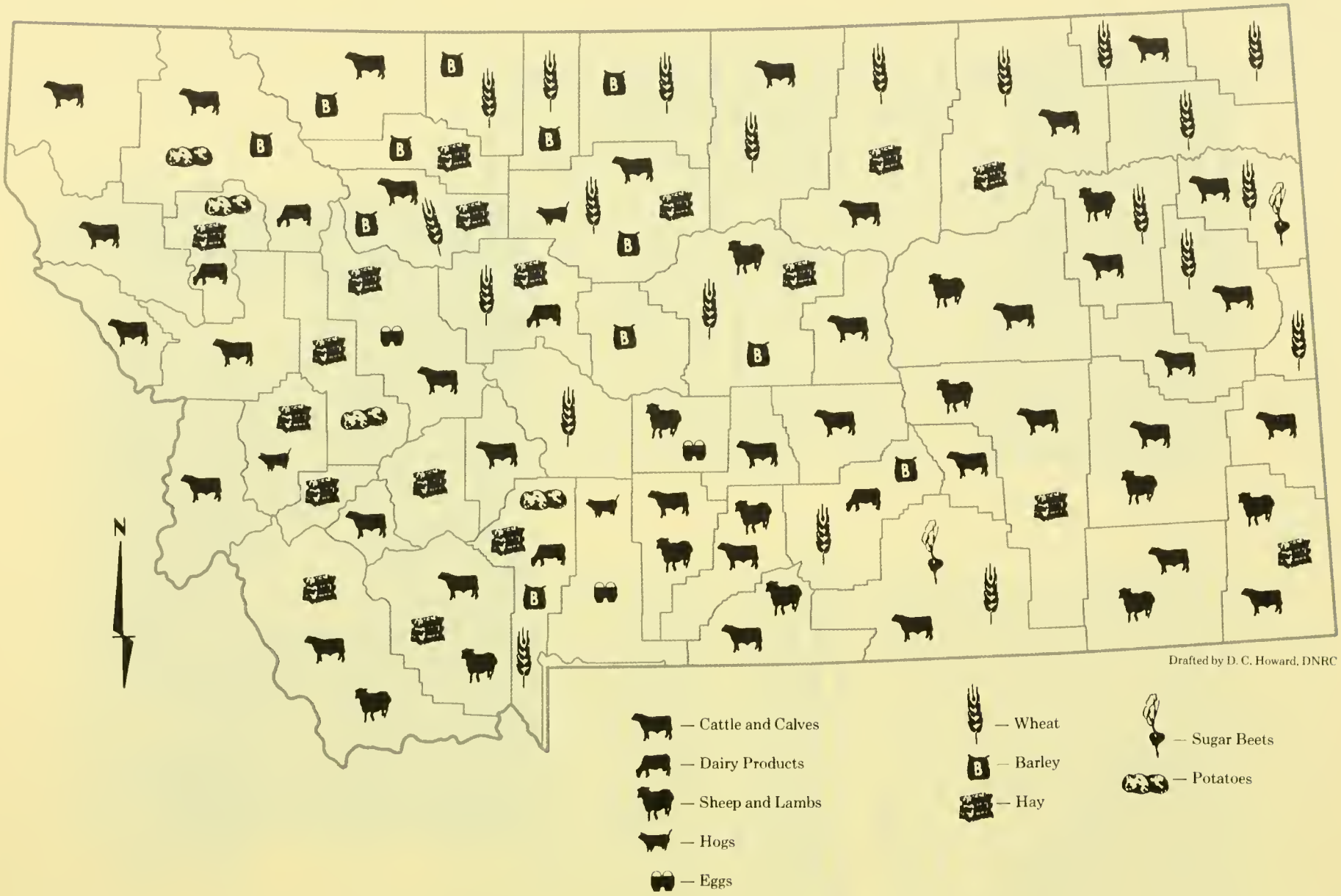
Only a few small canneries remain in the state today. The smaller Montana companies were not able to compete with big national canneries. Cherries, beef, trout, honey, and wild preserves are all processed in Montana today. Sugar is still manufactured, too. In 1986, over one million tons of sugar were refined at Sidney and Billings. However, many of the farms that once grew sugar beets are now raising barley or oats.

Montana farmers plant what grows best here—wheat, barley, hay, and root crops. Our state's major products are listed, in their order of importance, in table 2.

Map 2 shows where these products are produced. In special places, like the Flathead Lake area, farmers can grow delicious cherries. There, the warmer, moist air over the lake holds more heat during the growing season. Near Columbia Falls, where there is plenty of moisture and a cooler climate, mint is grown. If you visit the area around Kalispell, you'll see Christmas trees of all sizes. They are raised there and shipped to many other states. In the hot summers of eastern Montana, irrigated crops grow well—potatoes, sugar beets, and feed corn for livestock. But across northern and central Montana, the main crop is still wheat.

Table 2.
Agricultural Products — 1985

Livestock, Products	Value	Crops	Value
Cattle and calves	$690 million	Wheat	$249 million
Dairy products	44 million	Barley	62 million
Sheep and lambs	23 million	Hay	48 million
Hogs	21 million	Sugar beets	28 million
Eggs	8 million	Potatoes	16 million



Map 2. Some of the main agricultural products of Montana are shown in this map.

Grasslands: Cattle and Sheep

The first cattle herds in Montana were small. But there was all that grassland—and it was free! There were no fences. It was the time of the open range in the West. Some men believed they could raise many cattle to market size and not have to pay for pasture. These people thought that cattle could live on the grassland the way the buffalo had.

Some cattlemen (or stockmen) drove herds in from Texas. Others brought cattle from Oregon and Washington, where the climate was mild. In 1885 and 1886, the ranges were crowded with cattle. There were 664,000 cattle in Montana in 1886. Many stockmen didn't take their animals to market because beef prices were low. They decided to keep the cattle until prices went up. But winter came, and it was the coldest winter anyone could remember. The wind whistled across the prairies, and snow fell. The drifts of snow got so deep that the cattle could not reach the grass beneath. It was bitterly cold. The cattle were starving. Many thousands of cattle died before the spring of 1887. That time is still called "The Hard Winter." Almost half of the cattle owners went out of business.

The cattle owners who were left knew that they had to manage in a different way if they wanted to stay in the cattle business. They had learned a hard lesson—they had to feed their cattle hay during the winter. The stockmen started to cut wild hay and store it for the winter months. They began to use barbed wire to fence their ranges, so the cattle would not stray.

The stockmen brought new breeds of cattle into Montana to improve the quality of their livestock. Some owners got Angus cattle from Scotland. Other stockmen shipped Hereford, Shorthorn, and Durham cattle from England. These cattle were easier to herd and had more meat on them than the Texas Longhorns did. By breeding them with the tough range cattle, stockmen produced better cattle. By 1893 there were more cattle on the range than in 1886. But the stockmen ran their cattle in smaller herds, fed them through the winter, and gave them better care. When another hard winter struck in 1906-1907, cattle losses were far less than in 1887.

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Lots of cowboys were needed to round up cattle on the open range of eastern Montana.

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Herding sheep was often a hard, lonesome job.

Photo by L. A. Huffman

In 1917, World War I brought high prices for beef. Beef was needed to feed the soldiers who fought in the war. But then the 1930s depression made beef prices go down again. They stayed low until World War II.

When feed prices are high and beef prices are low, livestock raisers suffer severe losses. It costs more to raise the animals than the owners get when they sell them. At present, many ranchers are working hard just to stay in the cattle business. There are 2,400,000 cattle in Montana now.

Sheep have been in Montana since 1857. By 1880 there were 100,000 sheep grazing in the Smith River Valley, in the Mussellshell country, and on open range in other places. Sheep *survived* the "Hard Winter" of 1886-1887 better than cattle did. One reason was that the sheep were looked after by sheepherders. They were not turned out onto the range to survive as well as they could, as the cattle were. They also had heavy coats of wool to protect them from the cold.

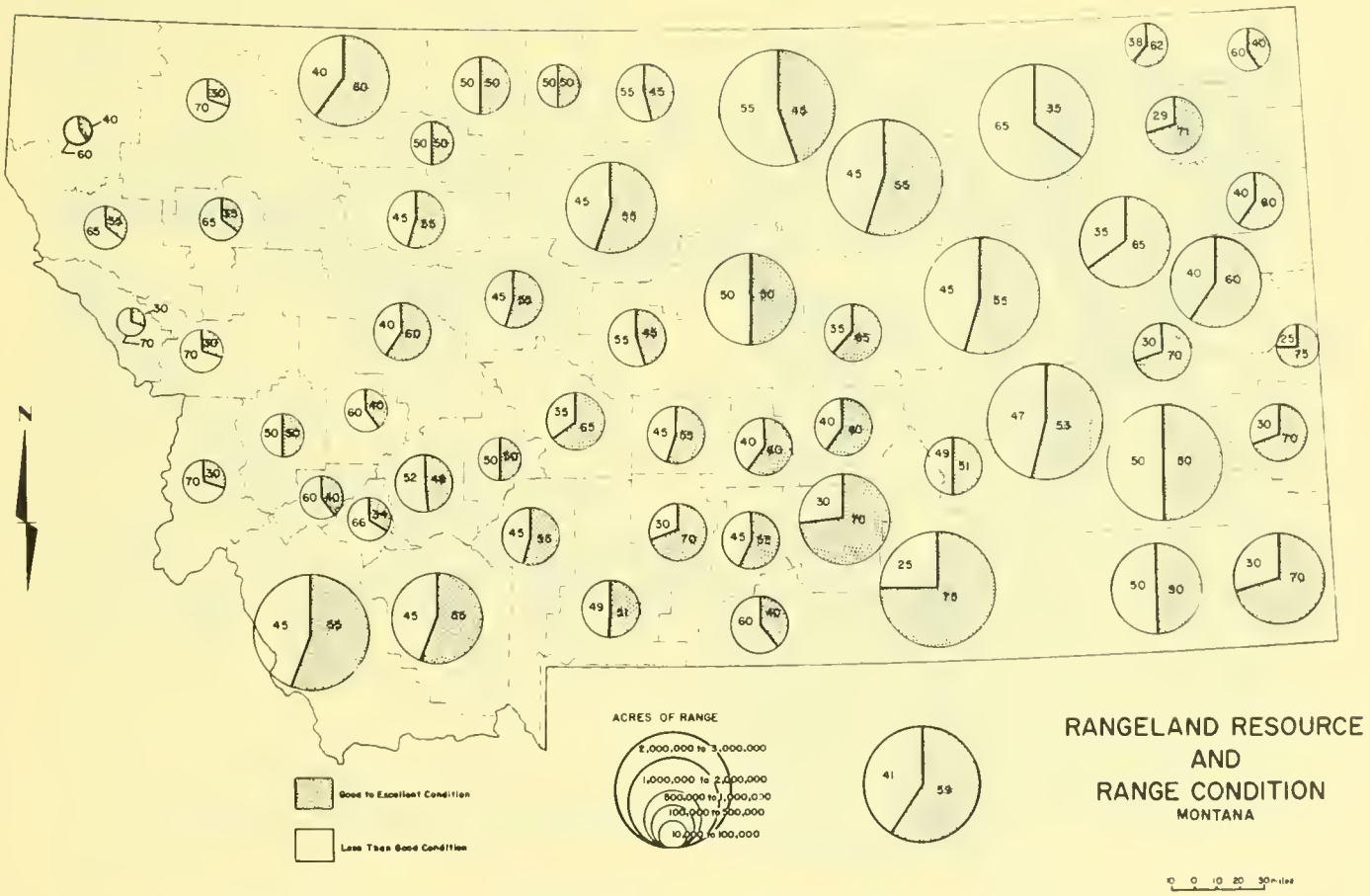
By 1900, 6 million sheep grazed in northern and central Montana and into the mountain valleys. Montana became the number one wool-growing state in the nation.

By the 1930s there were still over 4 million sheep in Montana. But higher labor costs and low prices for lamb and wool caused many stockmen to reduce their flocks of sheep. It had become harder to find good sheepherders to look after the sheep. Another reason for losses in the wool-growing industry was that other materials began to replace those made of wool.

At present, sheep make up only a small fraction of the state's income from farming and ranching. There are only about half a million sheep in Montana. The largest sheep ranch in the state is the Sieben Ranch near Helena.

The herds of cattle and flocks of sheep that spread across Montana's prairies and into the mountain valleys a hundred years ago overgrazed the grasslands. Native grasses and shrubs were destroyed. From the time of the homesteaders to recent years, some farmers have plowed grazing land to plant crops. Much of the plowed land would have been better for pasture, because the soils are too thin for crops.

It is taking a long time to get the grasslands back to the way they were before this damage. But farmers and ranchers are working with range specialists. Stockgrowers build fences and move their cattle from one area to another to let the grass grow back. Ranchers provide water tanks for the cattle in each pasture. They also fight weeds and reseed the land to native grasses. Millions of acres have been improved, but a great deal of work still has to be done to make our grasslands produce as much as they can. Then there will be better *habitat* for both livestock and wildlife. Map 3 shows range acreage and conditions in Montana.



Map 3. The acreage and condition of rangeland are shown in the circles.

Water: Above and Below Ground

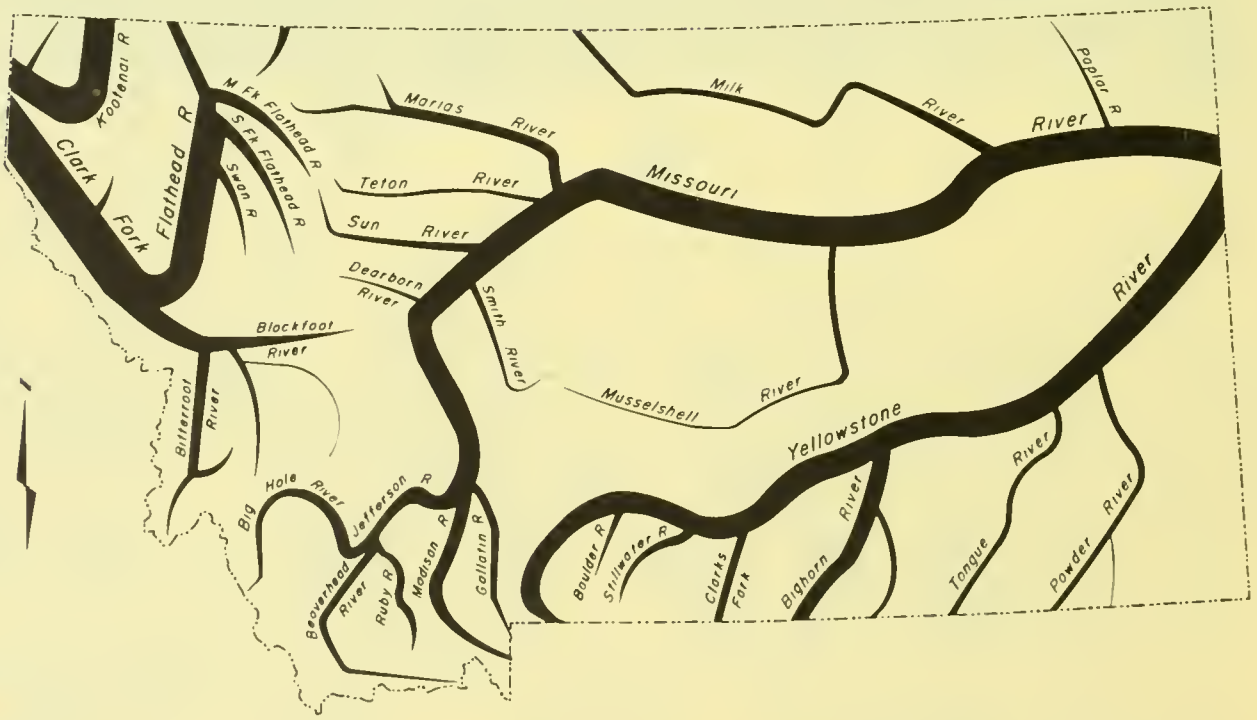
Water plays an important part in our history. Most of the valuable fur-bearing animals lived in or near the streams and rivers. Much of the placer gold was found in streambeds. When people discovered the value of the furs and minerals in the western region, rivers were the best way to travel *inland* and to *transport* goods. Often the early settlers built homes along the streams, and many of Montana's towns were established close to waterways. Later, these rivers provided water that was needed for industry, irrigation, and hydroelectric power (electricity produced by water).

The same water power that produces electricity can also cause great damage when water floods out of stream banks. Flooding can be dangerous to people and animals. It can destroy homes, roads, and bridges.

One of Montana's worst floods happened in 1964. After a four-year drought, rain came at last on June 6 to northern Montana. When the rain was over, an area from the Canadian border to the Sun River had been flooded. More than 30 people drowned on the Blackfeet Reservation.

In Montana, floods are most often caused in the spring by melting snow combined with heavy rains. Flooding can also occur almost any time of the year from heavy rainstorms. Logging, overgrazing, and some farming methods make floods worse by letting all the water flow away quickly, instead of soaking into the ground.

Several large dams and a number of smaller ones across Montana store water and help to control flooding. Although we try to prevent flood damage, water is a powerful force that can't always be controlled.



Map 4. All of Montana's major river systems have their beginnings (headwaters) in the Rocky Mountains.

Montana has three major river systems—the Clark Fork, which drains the northwestern area; the Missouri, which begins in the mountains of southwest Montana and sweeps north and east, onto the plains; and the Yellowstone, which flows through the south and southeastern part of the state. Map 4 shows our major river systems.

The water you see in Montana's rivers, streams, and lakes is called surface water. Surface water is by far our main source of supplies.

The other source of our water supply is hidden, and, although it is called ground water, underground water might be a better name for it. Ground water is stored in the earth in what are called aquifers. An aquifer might be sand, gravel, or broken rock. People drill wells into these storage zones so they can have water for their homes. A few people use wells to water their livestock or irrigate their crops.

It's important to have enough water, but the quality of the water is important, too. It should be clean and free from dirt or harmful chemicals. Some pollution is caused by natural flooding, mining, or the operation of heavy equipment. Careless use of *fertilizers*, *pesticides*, and other chemicals can pollute both surface and ground water. Waste materials that get into our streams and rivers damage water quality, too.

Our state and federal governments have passed laws to prevent water pollution. We also have programs to clean up some areas and to educate people about ways to protect water quality.

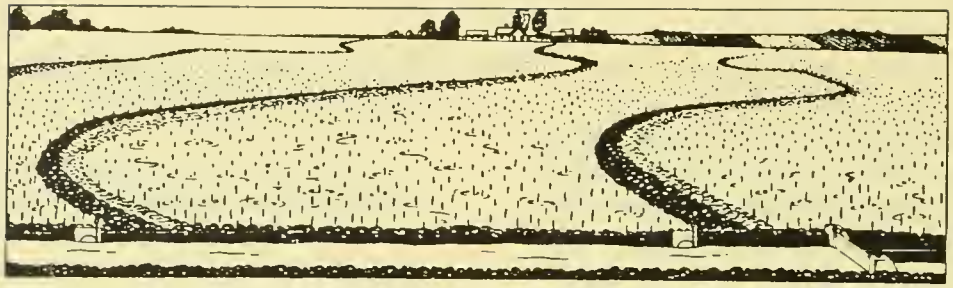
Irrigated Agriculture

Several things determine where certain crops can grow. Climate, soils, and *elevation* are the most important factors. Montana is a big state. In the northwest corner of the state, the climate is very moist. In the middle and the eastern parts of Montana, it is very dry. We have many different kinds of soil and elevations that range from 1,800 feet above sea level in the northwest corner of the state, to 12,800 feet at Granite Peak near Yellowstone Park.

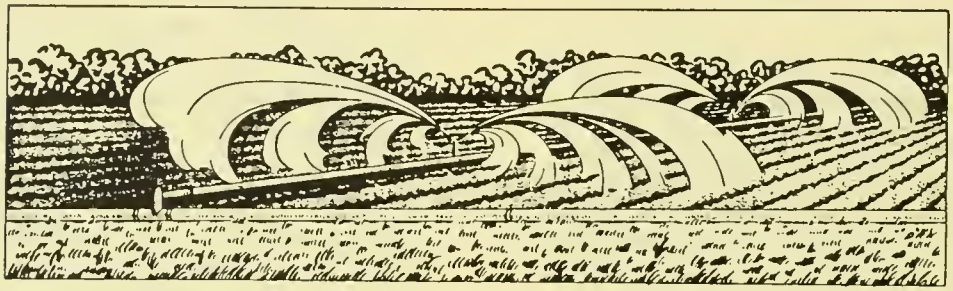
Most of the early irrigated agriculture took place in the mountain valleys in western Montana. The winters there are cold, but the snow usually gives plenty of moisture. The valley soils are good for growing crops. But even in these areas, sometimes there is not enough water for the crops. That is because in some years not enough snow and rain fall. Then crops are poor.

Farmers needed to have enough water to make their crops grow. So farmers made irrigation systems. They dug long ditches from streams and rivers to the fields. Some farmers also built small earth dams and made ponds to hold the water from rain and melting snow until they needed it.

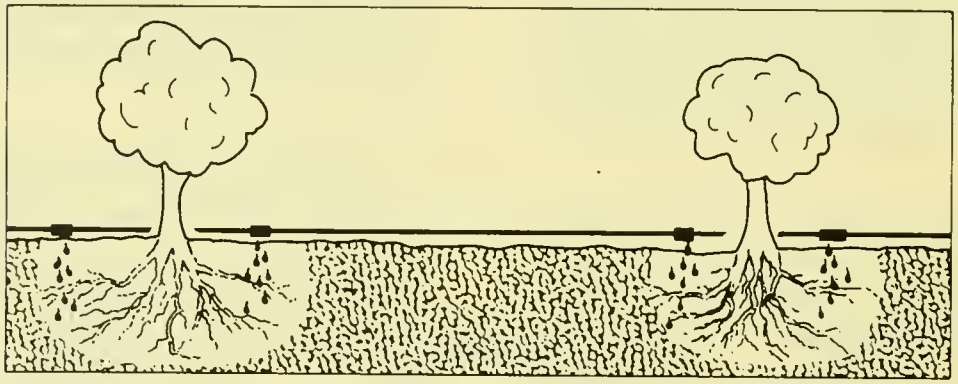
The United States government built several dams in the 1890s. Near Billings, the Huntley Project was begun in 1902. Dams were completed in 1906 on the Milk and Sun rivers in north central Montana. The Lower Yellowstone Project was constructed near the North Dakota border. Much later, in the 1950s, other dams like Canyon Ferry and Tiber helped to supply water to Montana farmers. These dams had other purposes, too. Most had turbines that used water power to make electricity. The dams also helped to control flooding and improve river traffic downstream. Fort Peck Dam in eastern Montana is one of the world's largest earth-filled dams.



Spread Irrigation.



Sprinkler Irrigation.



Drip Irrigation.

Today's farmers and ranchers also use water from 24 state-owned reservoir projects. Many farmers store water in ponds (or reservoirs) on their own land, too.

Improper irrigation can cause some problems. Putting too much water on a field can cause *erosion.* It can also wash fertilizers and pesticides into our streams and ground water. Different crops need different amounts of water, but putting too much water on some soils can cause the land to become too salty for most crops to grow.

Methods of irrigation have changed over the years. Many farmers use sprinkler systems that only need a third as much water as spread irrigation does. Drip irrigation works well in orchards and for crops that are planted in rows. As more and more people need to use the water, it's important not to waste it.

Very little water is left for new irrigation projects in Montana. Farmers need to know how much water they have for irrigation each year. State government is now trying to figure out how much water we are using in Montana and how much is left over to irrigate new areas.

The Homesteaders: Dryland Farming

In 1862, during the Civil War, the United States government began giving land to people who would settle the western areas beyond the Mississippi River. Later, larger pieces of land were given to people who would begin farming in the Great Plains. These settlers had to live on the land for a certain length of time before they owned it.

At the same time that the government gave land to the people, it also gave land to the railroads. The government gave this land to help the railroads build their tracks across the United States. Railroads were needed for transportation of people and merchandise of all kinds, such as food, tools, and machinery. Before the railroads came to Montana, the main transportation was by freight wagons or by steamboats.

The people who came to live on the land were called *homesteaders.* Montana was one of the last states to be settled by homesteaders. (Of course, there were people in Montana already. But they lived mostly in the western part of the state and along the rivers.) The railroads advertised low fares for homesteaders. They wanted people to start farming on the plains. They hoped to send freight cars full of wheat back to the eastern markets. From 1905 to 1925, tens of thousands of people came to Montana to farm. Some came from as far away as Europe.

To understand what happened to the homesteaders, you need to know something about Montana's climate. Most of Montana lies in the northern plains of the North American *continent.* These parts of Montana receive much less moisture than the eastern United States gets.

Montana Historical Society, Helena

Homesteaders had to live in these small houses built from kits — not much protection from the prairie wind.

Montana Historical Society, Helena

The tractor and the combine soon took the place of teams of horses on Montana's wheat farms. This picture was taken about 1916 in the Gallatin Valley.

Most of the homesteaders came from places where there was plenty of rainfall to raise crops. They had no idea of how dry the weather could be in Montana. At the height of the "homestead rush"—from 1910 to 1917—Montana had seven years of unusual rainfall. The people who planted wheat had good crops. Then the weather changed. It became drier and drier. The wheat *withered* in the ground. The wind blew the topsoil away. Wells went dry. Many people left Montana; they had lost everything. When the weather is like this on the plains, we call it a drought.

The farmers who didn't leave knew they had to look for better ways to farm. They had to save what moisture there was in the soil. They had to plant the kinds of wheat that would grow in Montana's dry climate. They learned to use different methods of tilling the soil. They also had to get used to the idea that they would get less grain from each acre. This meant they would be using larger, more expensive machinery to cultivate bigger areas.

Another drought struck in the 1930s. Together with a national depression, it drove more people away from farming. But those who held on slowly recovered. Today, Montana ranks second in the nation in farm and ranch acreage. Over 23,000 farms and ranches are in business on nearly 61 million acres.

One-third of Montana's farm produce is wheat. Markets for Montana's highly nutritious wheat are increasing. Asia, especially Japan, buys large amounts. Every month 20,000 tons of Montana wheat are shipped out of the barge port at Lewiston, Idaho. From there it goes down the Columbia River to ports on the west coast to be sent to Asia. Over one-half of our wheat is shipped overseas. Other shipments go by rail to markets in the eastern and southern United States.

Drought is still a *constant threat* to grain farmers on the high plains. Dryland farmers have tried many different ways to conserve moisture in the soil. One system that has worked well is planting wheat or other grain crops without plowing the ground. Planting crops in wide strips helps to prevent *erosion* from wind. The short stems (or stubble) of last year's crop are left between the strips. Rows of trees and bushes called windbreaks help to stop wind erosion, too.

Wind erosion is the most serious problem on dryland farms. If the soil surface is not protected by growing crops, or by stubble left after the harvest, the wind can blow away many tons of precious topsoil. (It may be hard to imagine, but 5 tons of soil would cover an acre with a layer only as thick as a dime.) Recently, much progress has been made in developing farming methods that protect the soil from erosion. However, Montana still has the worst wind erosion of any state in the nation.

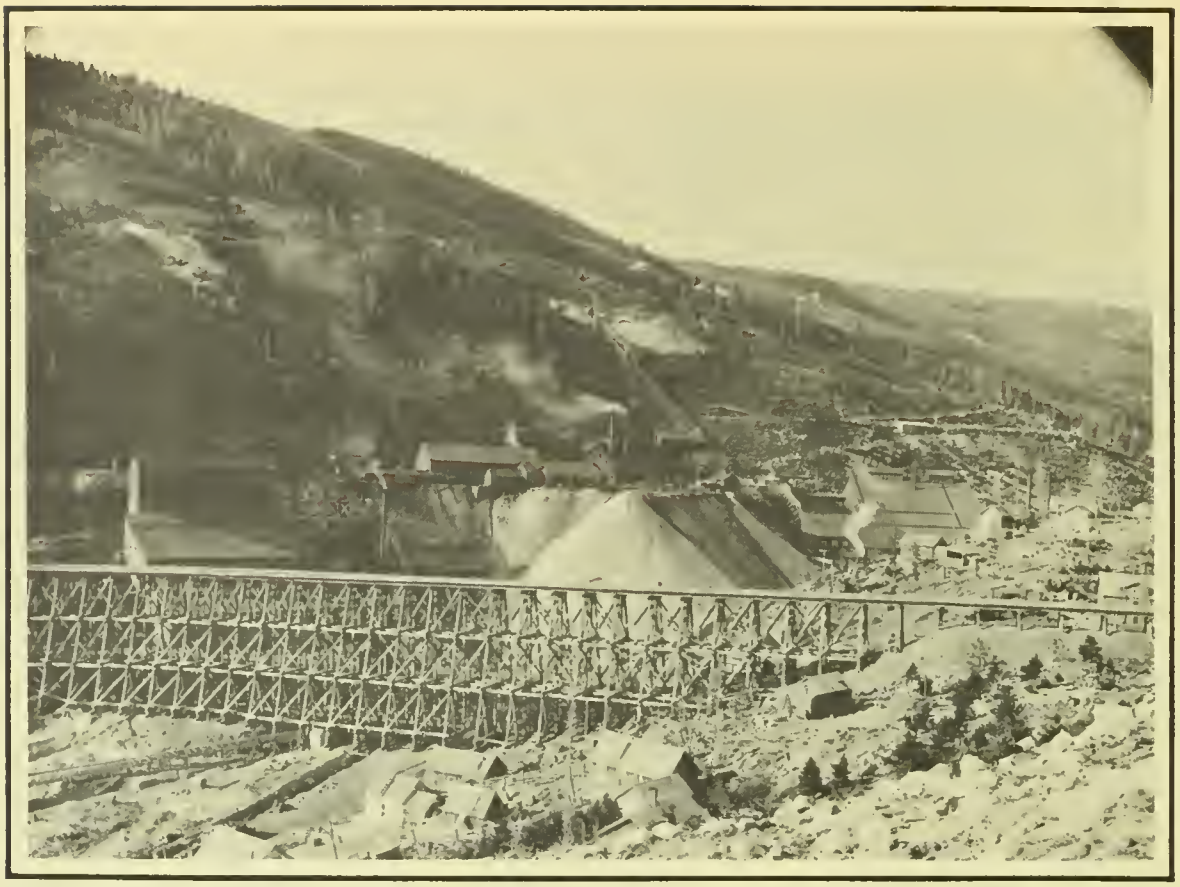
Forests

The timber industry got an early start in Montana. In the western mountains, people built their cabins from logs they cut nearby in the forests. They heated their homes with wood, too. When placer mining began, a great deal of lumber was needed. Crude sawmills were set up to turn out rough lumber for *sluice boxes*, *flumes*, and miners' shacks. Early photos of the mining camps show that most of the trees on the neighboring hillsides had been cut. When underground mining began, huge numbers of heavy beams were used to hold up the tunnels and shafts. Also, wood was burned to make steam power at the smelters and concentrators.

Among the first lumber companies in Montana was one in Missoula started in the 1870s. It later became the Montana Improvement Company. Copper king Marcus Daly owned a share of the company. The Northern Pacific Railroad (later called the Burlington Northern) also was in the timber business. The federal government had given the railroad every other section (or square mile of land) on either side of the tracks. In western Montana much of that land was forested. Railroads needed timber for *ties*, *trestles*, and bridges. Also, the steam engines that powered both the sawmills and the locomotives burned wood. People needed lumber for houses. Most of the buildings in the towns were built of wood. Even the sidewalks were wood.

Early logging followed the same pattern as fur trading and mining did. Little thought was given to the future. Some hillsides were left looking ragged and bare. Rain and melting snow eroded the land, and the dirt muddied the mountain streams. Without the forest, some kinds of wildlife had less protection from their enemies.

Montana Historical Society, Helena



If you look closely at this 1895 photo, you'll see how the timber was stripped from the hillsides, and used at the Drumlummon Mine at Marysville, Montana.

A wave of terrible forest fires came in the summer of 1910. Three million acres of forestland in Montana and Idaho were turned into blackened wastelands. Over eighty people were killed, several towns were burned, and untold numbers of wildlife were destroyed.

Around this time, the United States government began to work to conserve our forests. To help restore the forests that had been burned, millions of new trees were planted. Gradually, the forests grew back, but it was many years before the damage to the land, to wildlife, and to the streams was repaired.

Uncontrolled fire can be very harmful, but fire can help the forests by helping pine seeds sprout and making minerals in the soil available to plants. Sometimes fires are allowed to burn where they don't threaten human life or property. Such fires can make open spaces for deer, elk, and moose to feed. They also get rid of dead and diseased trees and underbrush.

Today better logging methods help to prevent damage to the land. More care is taken to build roads and stream crossings in ways that won't cause erosion. Laws help to protect the environment, too. Many people are working together to be sure that we can always enjoy both the living forests and the products that come from them.

Timber has many more uses today than it did in early times. Sawmills turn the long, straight lodgepole pine into utility poles, posts, and house logs. Turpentine, *veneers*, plywood, *particleboard*, cartons, and *wood pellets* for stoves are all made in Montana. Boards, two-by-fours, and millwork for trim and window frames are other products.

Sometimes lumber and other wood products are in great *demand*. However, when fewer buildings are being constructed, the demand for lumber drops, and production slows down. At present, Montana post-and-pole companies are doing better than the companies that sell wood building materials. In 1980, over 10,000 people were working in the state's wood products industry. In 1986 about 8,500 were employed in Montana's wood products industry.

Wildlife

When the Lewis and Clark expedition explored the area we now call Montana, they found the plains full of wildlife. They saw moose as far east as where the Milk River joins the Missouri, and grizzly bear and wolves ranged to the present North Dakota border. The explorers saw herds of elk and antelope in what is now eastern Montana. And of course there were the buffalo—hundreds of thousands of buffalo.

In the western mountains, the expedition saw fewer moose, elk, and bear, but the opposite is true today. These animals are now mostly in the mountains and high valleys of western Montana. This change began when the fur trade came to an end in the 1850s, and a trade started in elk, deer, and buffalo hides. By 1884, the last of the buffalo had been killed off, and so had many of the deer and elk. The final slaughter of the buffalo was a waste of a natural resource. It also was the end of a way of life for the Plains Indians who depended on the buffalo for food and hides. As stockmen moved onto the grasslands, herds of cattle and flocks of sheep took the buffalo's place on the plains. The elk retreated to the protection of the mountains. Deer moved into sheltered valleys and brushlands.

> "The whole face of the country was covered with herds of buffalo, elk, and antelopes; deer are also abundant, but keep themselves more concealed in the woodland."
>
> — Meriwether Lewis

Montana was still a territory when our legislature began to establish hunting seasons in 1870 and 1872. Some big game animals were already getting scarce. These first game laws were an early attempt to conserve our wildlife, but the laws were ignored by some of the people. By 1900, many of the animals and birds that had been plentiful were disappearing. Some species became *extinct*. Other animals, like the bighorn sheep, died when they caught diseases from *domestic animals* that had invaded their territory.

In the early 1900s, game officials began to enforce hunting laws strictly. Numbers of wildlife again began to grow. *Transplanting* animals helped to start new herds of deer, elk, and antelope. The best solution to helping our wildlife to survive is to make sure that the animals have suitable places to live where they have food and shelter.

Today there are more elk, deer, and antelope in Montana than there were in the early 1900s. White-tailed deer and mule deer range over most of the state. Buffalo live on the National Bison Range in the Flathead Valley and on the Charles M. Russell National Wildlife Refuge in eastern Montana. Fifteen wilderness areas and several wildlife refuges are home for grizzly bear, mountain lion, eagles, and other wildlife. Lakes, streams, and farm ponds provide waterfowl with homes or with resting spots as they *migrate* in the spring and fall.

Most kinds of wildlife in Montana are not hunted for food or sport. These animals and birds are called nongame species. They make up over four-fifths of the kinds of wildlife we have. In recent years, more and more people have learned to appreciate them. Bird watching, for example, is enjoyed by thousands of Montanans. However, some nongame species are also in danger of becoming extinct.

In Montana we have many kinds of wildlife—over 600 different kinds of birds, mammals, fish, and reptiles. When we think of this great variety of wildlife, we realize how fortunate we are.

Recreation

Montana's second largest industry doesn't produce anything that can be packaged, loaded on a freight car, or exported. You have to be here to enjoy it. That industry is recreation. We share this pleasure with friends and visitors alike. And we use some of our natural resources very differently today.

Elk, deer, and antelope are still here, but many hunters of today hunt because of the skill it takes and the satisfaction it provides, as well as for the meat. Some people hunt only with cameras. Our streams still can provide an angler with fish for sport or supper. The rugged mountains that once were a *barrier* to early explorers now have trails for hikers, climbers, and backpackers. The rivers so necessary to early-day travel and commerce now give people in rafts and canoes an enjoyable time in the outdoors. Montana's 1,500 lakes still offer boating, swimming, and fishing in summer, and some offer ice-fishing in winter. Lewis and Clark relaxed at a Montana hot springs on their journey home, and our state's many hot springs are still popular with weary travelers.

The old mining camps no longer *resound* with the noise of stamp mills, but you can pan for gold along many creeks and explore ghost towns in those areas. And even though the days of the open range are gone, you can capture some of the excitement at a rodeo.

Everywhere you go in Montana, you can see many reminders of our history if you know where to look. Historic markers and recreation areas have signs that will tell you more. You can get lists of interesting places to visit from the Department of Commerce. The Montana Historical Society in Helena has exhibits that show the people and events that are a part of our history.

In the 1960s and 1970s Senator Lee Metcalf worked for laws that would protect our environment.

Conclusion

The history of Montana's natural resources and their uses is in many ways the history of the West. Many of the people who used our resources took what they wanted and put nothing back. In some cases, this carelessness did great damage to the environment. Sometimes, as we have seen, the problems became very serious before anyone did anything about them.

Over the years, however, people have learned that they must take care of what they have. Now many Montanans are working to conserve our resources so we can continue to live in a place that is both productive and beautiful.

You can find out more by reading the books listed under "Further Reading" and by joining in activities that will help you understand how important our resources are now, and will be in the years ahead. We hope you will be among the people who use these valuable resources wisely.

Vocabulary

barrier
a high wall or obstacle that keeps one from going farther

buffalo jump
rocky cliff over which Indians drove buffalo so they could kill them for their meat and hides

cache
to hide or store away

camas
a plant of the lily family with bulbs that can be eaten

colony
area far from the country that rules it

commercially
for sale

concentrator
a place where the metals removed from the ore are processed to separate them

conductor
a material that electricity or heat can move through easily

constant threat
a danger that is always present

continent
any of the main large land areas of the earth, such as Africa, Asia, Australia, or North America

demand
a need for a certain product

diesel
a type of engine that burns fuel oil

disappear
to go out of sight, become lost

domestic animal
an animal raised for food or other use

elevation
height above the surface of the ocean

erosion
the result of being eaten away by wind or water

expanse
large area or space

expedition
a journey or trip with a special purpose or reason

extinct
no longer living

fertilizer
any material, such as manure or chemicals, that is put on the soil to make a crop grow better

flume
a sloping trough, somewhat like a rain gutter, down which water is run

frontiersmen
people who could live in an unexplored country

Great Depression of the 1930s
a time when, around the world, businesses failed, people did not have jobs, and prices and wages were very low

gradually
little by little

gulch
a steep-walled valley with a swift stream running through it

habitat
a place where a plant or animal naturally lives

homesteader
settlers who owned a piece of land granted by the United States government on certain terms

inland
away from the coast or border of a country

interpreter
someone who explains the meaning of another language

mastodon
an animal like an elephant, but larger, that is now extinct

migrate
to move from one area to another with the changing of the seasons

missionary
a person sent out by a church to preach and teach

native grass
grass that grows naturally in an area

nutritious
valuable as food

ore
mineral from which metals can be taken

particleboard
a board made by pressing sawdust or small bits of wood together with glue

pesticide
chemical used for killing insects or weeds

plentiful
having more than enough

pollute
to dirty, make unfit for human or animal use

portage
carry boats and supplies over land

process
make in a certain way, using the same method each time

prospector
a person who looks for valuable minerals

refinery
a plant where the impurities in crude oil are removed

region
an area on the face of the earth

remarkable
unusual

resound
echo

sluice box
a box with cleats or strips of wood nailed in the bottom to catch gold or other heavy metals when water is run through it

smelter
a place where impurities are removed from ore

survive
live in spite of great hardship or trouble

tepee ring
circle of rocks used to hold down the edges of an Indian tepee

territory
any large area of land

tie
the cross beam or timber to which the rails of a railroad are fastened

transplant
move from one place to another

transport
to carry from one place to another over a long distance

trestle
a framework holding up a bridge

uncharted
unmapped, a place for which no maps have been made

vein
mineral deposit in cracks or crevices that is different from the rock around it

veneer
thin layers of fine quality wood

withered
dried up, shriveled, wilted

wood pellet
a little ball of tightly-packed sawdust used as fuel instead of wood

Suggested Projects

Early People

With modeling dough, build a model of an Indian village, with tepees and campfires. Show how meat was dried on racks and hides were tanned.

Your group could learn to dye pieces of cloth with natural colors. Berries are good to make red and purple; sage brush makes a soft green, and onions give a yellow color. Boil and strain the natural material and soak your cloth in the liquid.

Western Expansion
Plan an expedition of your own. What would you take if you were going to explore a strange place? What if there were no stores to buy things along the way?

Make a map of an area you know about. Mark important places, creeks, hills, or highways. Could a stranger find the way through the area by following your map?

The Fur Trade
Find out how animal skins are tanned. Draw pictures of some things that are made out of hides.

Write a story about a day in the life of an old-time trapper. What problems would he have? What would he eat? Is his life dangerous?

Minerals
Find out what a mine looks like. What is the main difference between an underground mine and an open pit mine? If there is an open pit or strip mine in your area, you may be able to arrange for a tour.

Start a collection of Montana minerals. Label them, and show where they are found.

Agricultural Products
On a map of Montana, mark the places you think would be best for growing crops that aren't shown on the map in this booklet, such as cherries, mint, and apples. What crops grow in your area?

Try to visit a farm near your home, and find out what crops are raised there, and when they are harvested. What machinery does the farmer use?

Grasslands
Write a short play about early-day cattlemen. Did they get along with the sheepmen? What were some of the difficulties they had?

Read about cattle raising in the 1880s. Did you know that cattle thieves (rustlers) were a big problem along the northern border of Montana?

Water
Perhaps your group could arrange a field trip to a nearby state or federal water project, to see how a dam is operated.

Make a list of the ways you use water, and try to imagine what you would do if you had no water, even for a day.

Irrigated Agriculture
If there are farms nearby, you may be able to take a field trip to see how irrigation systems work.

Invite a local farmer to talk to your group about irrigation methods, or about some of his other farming practices.

Homesteaders
Read about the homesteaders. Maybe your county has published a history of the early settlers.

Interview someone who farmed during the Depression of the 1930s. Write a short article about how things were then.

Forests
Learn to identify the trees in your neighborhood or in your city park. Perhaps your group could have a guest speaker from the U.S. Forest Service help with this project.

Visit a wood-working shop. Find out what the different kinds of wood look like, and what they are used for.

Wildlife
Find out which Montana birds and animals are considered endangered, threatened, or are actually extinct.

Have a speaker from the Department of Fish, Wildlife and Parks talk to your group about our wildlife and its importance to our state.

Recreation
Help your family plan an outing in your area. What is there to do and see?

Get some friends together and learn how to do orienteering—that is, how to find your way with maps and compass.

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Acknowledgments

The Department of Natural Resources and Conservation would like to thank the agencies and individuals who helped with information and review. The Montana Historical Society, Office of Public Instruction, Lewis and Clark Library, Helena Middle School, and Helena's Central School were particularly helpful, but many others offered valuable assistance in making this publication possible.

Direction: Carole Massman
Research and writing: Peggy Todd
Layout: June Virag
Maps: Barbara Lien and D. C. Howard
Production: Gordon Taylor
Word Processing: Margie Peterson
Technical Review: Rich Brasch, Pete Husby, Jack Thomas, Earl Griffith, Deeda Richard, and Gerhard Knudsen, all of DNRC; Bill Phippen, DFWP, and Larry Thompson, NRIS.

The Montana Department of Natural Resources and Conservation has had many requests for information about the minerals, water, forests, and other resources in Montana. A series of booklets has been created to answer some of these questions and to stimulate an interest in the natural resources of Montana. One copy of the 7-booklet set, "Montana's Natural Resources," is available for $2.75, plus $1.50 postage.

1987

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION

1520 EAST SIXTH AVENUE
HELENA, MONTANA 59620-2301